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Inventor(s): Raymond Bennett, Robert Bossmeyer, Donald Liebrecht, and Barry Sullivan
Title: HOME GATEWAY SYSTEM FOR AUTOMATION AND SECURITY

Enclosed are:

X 8 sheets of informal drawings, along with 17 pages of specification and claims. An assignment transmittal letter with Assignment of the invention to Ameritech. A verified statement to establish Small Entity status under 37 CFR 1.9 and 37 CFR 1.27.X A List of References.X The filing fee is calculated below:

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Robert W. Bossemeyer, Raymod Bennett, Donald Liebrecht, and Barry Sullivan

CASE NO.: A00424(AMT-9713)

ENTITLED: HOME GATEWAY SYSTEM FOR HOME AUTOMATION AND SECURITY

Law Offices of Dale B. Halling
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June 12, 1998

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HOME GATEWAY SYSTEM FOR HOME AUTOMATION AND SECURITY

5 Field of the Invention

10 The present invention relates to home automation and security systems and more particularly to a home gateway system for home automation and security.

15 Background of the Invention

20 Because of increased security concerns many home owners have a home security system. In addition, many home owners have a variety of machines for receiving information services, such as a cable receiver box, several telephones, an answering machine, a caller ID box, a home Local Area Network (LAN), and a dial up connection to the internet. Unfortunately, only minimal integration has occurred between the security system and these information services. A number of additional features could be provided to a home owner if these services were integrated.

Thus there exists a need for a home gateway system that can integrate the security and home automation features with the information services already found in many homes.

Brief Description of the Drawings

FIG. 1 is a schematic diagram of a home gateway system for home automation and security in accordance with one embodiment of the invention;

FIG. 2 is a block diagram of a home gateway system for home automation and security in accordance with one embodiment of the invention;

FIG. 3 is a block diagram of a home gateway system for home automation and security in accordance with one embodiment of the invention;

FIG. 4 is a block diagram of a voice processing system in accordance with one embodiment of the invention;

FIG. 5 is a flow chart of the steps used in a home gateway system for home automation and security in accordance with one embodiment of the invention;

FIG. 6 is a flow chart of the steps used in a home gateway system for home automation and security in accordance with another embodiment of the invention; and

FIGs. 7 & 8 are a flow chart of the steps used in a home gateway system for home automation and security in accordance with another embodiment of the invention.

Detailed Description of the Drawings

The home gateway system for home automation and security has a wireless local loop transceiver. A home automation controller is capable of sending and receiving a message with the wireless local transceiver. A home security controller is capable of sending and receiving a message with the wireless local loop transceiver and the home automation controller. The home gateway system for home automation and security integrates the home automation, home security and with a wireless local loop transceiver. This allows the security system and the automation system to be activated, deactivated and monitored remotely.

FIG. 1 is a schematic diagram of a home gateway system for home automation and security in accordance with one embodiment of the invention. The home gateway system 20 is located inside a house 22. The home gateway system 20 has an input to receive a cable television 24 input signal. The home gateway system 20 is also connected by a wireless local loop 26 and a base station 28 to the public switch telephone network (PSTN) 30. The antenna 32 for the wireless local loop 26 is shown in the attic of the house. The PSTN 30 provides access to an internet service provider (ISP) 34, which provides access to the internet 36. A telephone 38, television 40, computer 42, printer 44 can all be connected to the home gateway system 20. In addition, appliances 46, lights 48 and sprinkling systems 50 can be connected to the home gateway system as part of the home automation features. A home security system 52 can also be connected to the home gateway system

20. This allows the home automation and security features to be integrated into the home communication system. For instance, the computer 42 can be used to setup times of day for the sprinkling system to turn on or the computer can print a report of the activities of the appliances or the security systems.

FIG. 2 is a block diagram of a home gateway system 60 for home automation and security in accordance with one embodiment of the invention. The home gateway system 60 has a wireless local loop transceiver 62. A home automation controller 64 is capable of sending and receiving messages from the wireless local loop transceiver 62. A home security controller 66 is capable of sending and receiving messages from the wireless local loop transceiver 62.

FIG. 3 is a block diagram of a home gateway system 70 for home automation and security in accordance with one embodiment of the invention. In this embodiment the transceiver 72 establishes a wireless local loop connection 74 with a base station 28. The transceiver 72 is connected to a switch 76. The switch 76 is connected to a voice bridge 77, a processor 78 and a router 80. The switch 76 also has a plurality of input lines 82. Telephones, facsimile machines and modems are among the devices that can be connected to the switch 76. The router 80 allows a user to establish a local area network within his home. The router 80 in this embodiment is connected to a television processing system 82 and a home automation and security system 84. The processor 78 is connected to a smart card interface 86. The smart card interface is used as a keyless entry and to store certain home automation setups. A voice processing system 88 is connected to the processor 78. The voice

processing system 88 includes voice verification and speech recognition capabilities. The voice verification capability is used for remote access to the home automation and security system or is used for keyless entry. A caller identification system 90 is connected to the processor 78. The caller identification system 90 can be used as part of a remote access screening.

FIG. 4 is a block diagram of a voice processing system 88 in accordance with one embodiment of the invention. The voice processing system contains a speech recognition system 100, a speaker verification system 102, a speech synthesis system 104 and a voice mail memory system 106. The control of the systems of the voice processing system 88 is performed in one embodiment by the processor 78. The processor 78 coordinates the voice system 100-106 to provide machine reception for remote access to the home security system.

FIG. 5 is a flow chart of the steps used in a home gateway system for home automation and security in accordance with one embodiment of the invention. The process starts, step 120, by receiving a request for access to a home automation and security features from a user at step 122. A speaker verification of the user is performed at step 124. When the user is verified, the user is allowed access to the home automation and security features at step 126. At step 128, a voiced instruction is received which ends the process at step 130.

In one embodiment, the step of receiving a request for access to the home automation and security features further includes inputting an electronic address of the home gateway system. Next, an electronic connection is established with the home gateway system. The user is

then presented with a plurality of options including the home automation and security features. In one embodiment the step of entering the electronic address, is performed by dialing a phone number. In another embodiment the electronic connection is a wireless local loop telephony connection.

In yet another embodiment the electronic connection is an internet connection and the user clicks on the home automation and security features option. The internet connection can be carried over the wireless local loop or over the cable TV link.

In one embodiment the speaker verification step further includes requesting a user to speak an access code. The access code is recognized using speech recognition. When the access code is valid and belongs to a set of approved access codes, a speaker verification is performed. When the speaker verification fails, the user is requested to enter a personal identification number. When the personal identification is valid, the user is allowed access to the home automation and security features. When the personal identification is not valid the user is denied access to the home automation and security features.

In a further embodiment the voiced instruction is recognized using the speech recognition system. The recognized instruction is converted into an electronic instruction that the home automation and security system can understand. The electronic instruction is then sent to the home automation and security controller.

FIG. 6 is a flow chart of the steps used in a home gateway system for home automation and security in accordance with another embodiment of the invention. The process starts, step 150, by

monitoring a parameter at step 152. When the parameter exceeds a defined range, a message is sent containing an electronic address to a processor at step 154. A communication link to the electronic address is established over a wireless local loop at step 156. At step 5 158 the message is transmitted to the electronic address, which ends the process at step 160.

In one embodiment the parameter is a forceful entry signal and the message contains a police telephone number. In another embodiment a portion of the message is speech synthesized to form an audio message. The audio message is transmitted to the electronic address. For instances, the audio message could include the street address of house and which sensor was tripped. In addition, the message could tell the police if the owners are home. 10

In another embodiment the message includes an internet address of the police. A message is sent to a police computer and includes the street address of house and which sensor was tripped. In yet another embodiment the parameters monitored can be an appliance. The data points for the parameter can be sent over the internet to the owner at a remote location. This would allow a homeowner to determine if a sprinkler was left on or the furnace had quit working. 15 20

FIGs. 7 & 8 are a flow chart of the steps used in a home gateway system for home automation and security in accordance with another embodiment of the invention. The process starts, step 25 180, by the user dialing a telephone number of the home gateway system at step 182. A wireless local loop connection is established

with the home gateway step at step 184. The user then selects the home automation and security features from a plurality of options at step 186. A speaker verification is performed of the user at step 188. When the user is verified, the user is allowed access to the home automation and security features at step 190. A voice instruction is received from the user to setup the home security controller in a warning mode at step 192. A forceful entry signal is monitored at step 194. When the forceful entry signal exceeds a defined range, a message containing a police telephone number is sent to a processor at step 196. A communication link to the police telephone number is established over wireless local loop at step 198. At step 200, the message is transmitted to the police telephone number, which ends the process at step 202.

Using the invention described herein the communication functions are integrated with a home automation and security system to allow remote access to the home automation and security system. In addition, the home automation and security system can automatically send messages to the police, fire department, hospital or to owner at work.

The methods described herein can be implemented as computer-readable instructions stored on a computer-readable storage medium that when executed by a computer will perform the methods described herein.

While the invention has been described in conjunction with specific embodiments thereof, it is evident that many alterations, modifications, and variations will be apparent to those skilled in the art

[illegible]

Claims

What is claimed is:

5

1. A home gateway system for home automation and security comprising:

a wireless local loop transceiver;

10

a home automation controller capable of sending and receiving a message with the wireless local loop transceiver; and

a home security controller capable of sending and receiving a message with the wireless local loop transceiver and the home automation controller.

15

2. The home gateway system of claim 1, further including a smart card interface capable of sending a plurality of instructions to the home automation controller.

20

3. The home gateway system of claim 1, further including a voice processing system coupled to the home security system.

4. The home gateway system of claim 3, wherein the voice processing system includes a speaker verification module.

25

5. The home gateway system of claim 3, wherein the voice processing system includes a speech recognition module.

6. The home gateway system of claim 1, further including a switch connecting the wireless local loop telephony connection to the home security controller.

7. The home gateway system of claim 1, further including a plurality of sensors connected to the home security controller.

8. A method of operating a home gateway system for home automation and security, comprising the steps of:

(a) receiving a request for access to a home automation and security features from a user;

(b) performing a speaker verification of the user;

(c) when the user is verified, allowing the user access to the home automation and security features; and

(d) receiving a voiced instruction.

9. The method of claim 8, wherein step (a) further includes the steps of:

(a1) inputting an electronic address of the home gateway system by the user;

(a2) establishing an electronic connection with the home gateway system;

(a3) selecting the home automation and security features from a plurality of options.

5

10. The method of claim 9, wherein the step of inputting the electronic address includes the step of dialing a phone number.

10

11. The method of claim 9, wherein the step of establishing the electronic connection includes the step of setting up a wireless local loop telephony connection.

12. The method of claim 8, wherein step (b) further includes the steps of:

15

(b1) requesting a user to speak an access code;

(b2) performing a speech recognition on the access code;

(b3) when the access code is recognized and belongs to a set of approved access codes, performing a speaker verification;

20

13. The method of claim 12, further including the steps of:

(b4) when the speaker verification fails, requesting a user enter a personal identification number.

25

14. The method of claim 8, further including the steps of:

(e) performing a speech recognition of the voiced instruction;

5 (f) converting the voiced instruction into an electronic instruction;

(g) sending the electronic instruction to a home automation and security controller.

10 15. A method of operating a home gateway system for home automation and security, comprising the steps of:

(a) monitoring a parameter;

15 (b) when the parameter exceeds a defined range, sending a message containing an electronic address to a processor;

(c) establishing a communication link to the electronic address over a wireless local loop; and

(d) transmitting the message to the electronic address.

20 16. The method of claim 15, wherein step (b) further includes the step of:

25 (b1) when the parameter is a forceful entry signal, sending the message that contains a police telephone number to the processor.

17. The method of claim 15, wherein step (d) further includes the step of:

5 (d1) speech synthesizing a portion of the message to form an audio message;

(d2) transmitting the audio message to the electronic address.

10

18. A home gateway system for home automation and security comprising:

- 15 a wireless local loop transceiver;
a switch connected to the wireless local loop transceiver;
a processor connected to the switch;
a voice processing system connected to the processor;
a router coupled to the switch;
a home automation controller connected to the router; and
20 a home security controller connected to the router.

19. A method of operating a home gateway system for home automation and security, comprising the steps of:

25

(a) dialing a telephone number of the home gateway system by a user;

(b) establishing a wireless local loop connection with the home gateway system;

5 (c) selecting a home automation and security features from a plurality of options;

(d) performing a speaker verification of the user;

(e) when the user is verified, allowing the user access to the home automation and security features;

10 (f) receiving a voiced instruction to setup a home security controller in a warning mode;

(g) monitoring a forceful entry signal;

(h) when the forceful entry signal exceeds a defined range, sending a message containing a police telephone number to a processor;

15 (i) establishing a communication link to the police telephone number over a wireless local loop; and

(j) transmitting the message to the police telephone number.

20

HOME GATEWAY SYSTEM FOR HOME AUTOMATION AND SECURITY

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Abstract of the Disclosure

10 The home gateway system (60) for home automation and security
has a wireless local loop transceiver (62). A home automation controller
(64) is capable of sending and receiving a message with the wireless
local loop transceiver (62). A home security controller (66) is capable of
sending and receiving a message with the wireless local loop transceiver
(62) and the home automation controller (64).

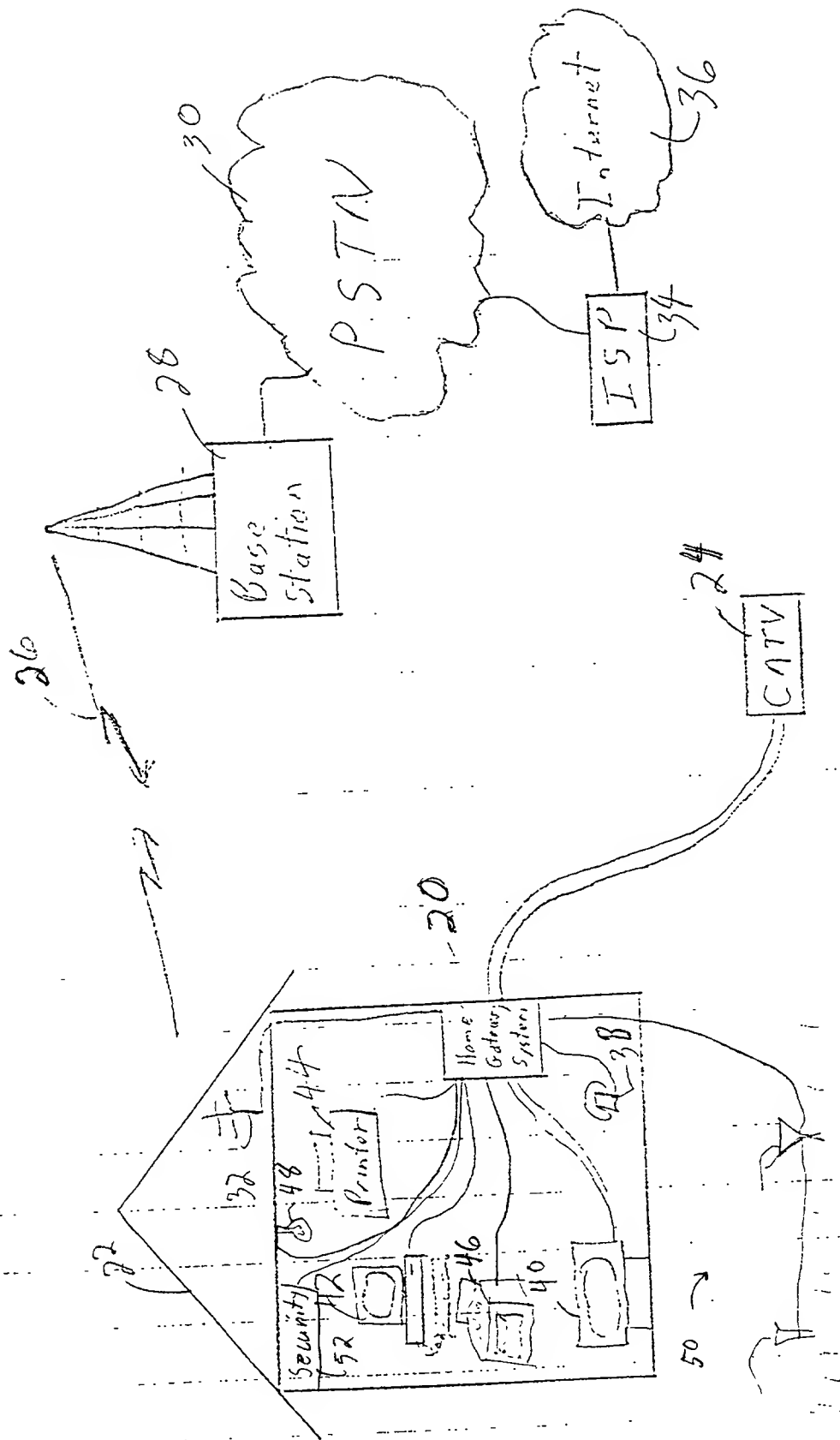


FIG. 1

60

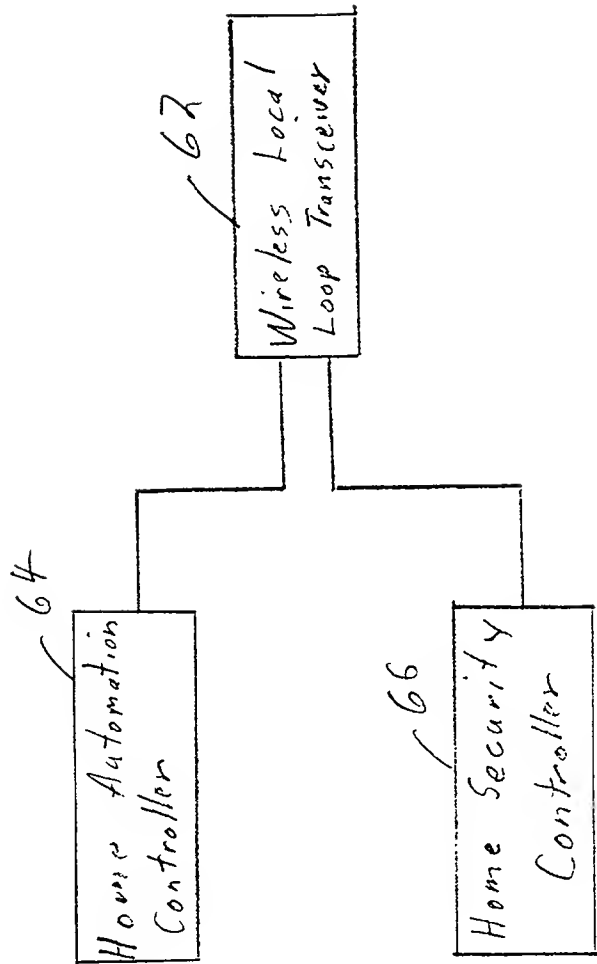


FIG. 2

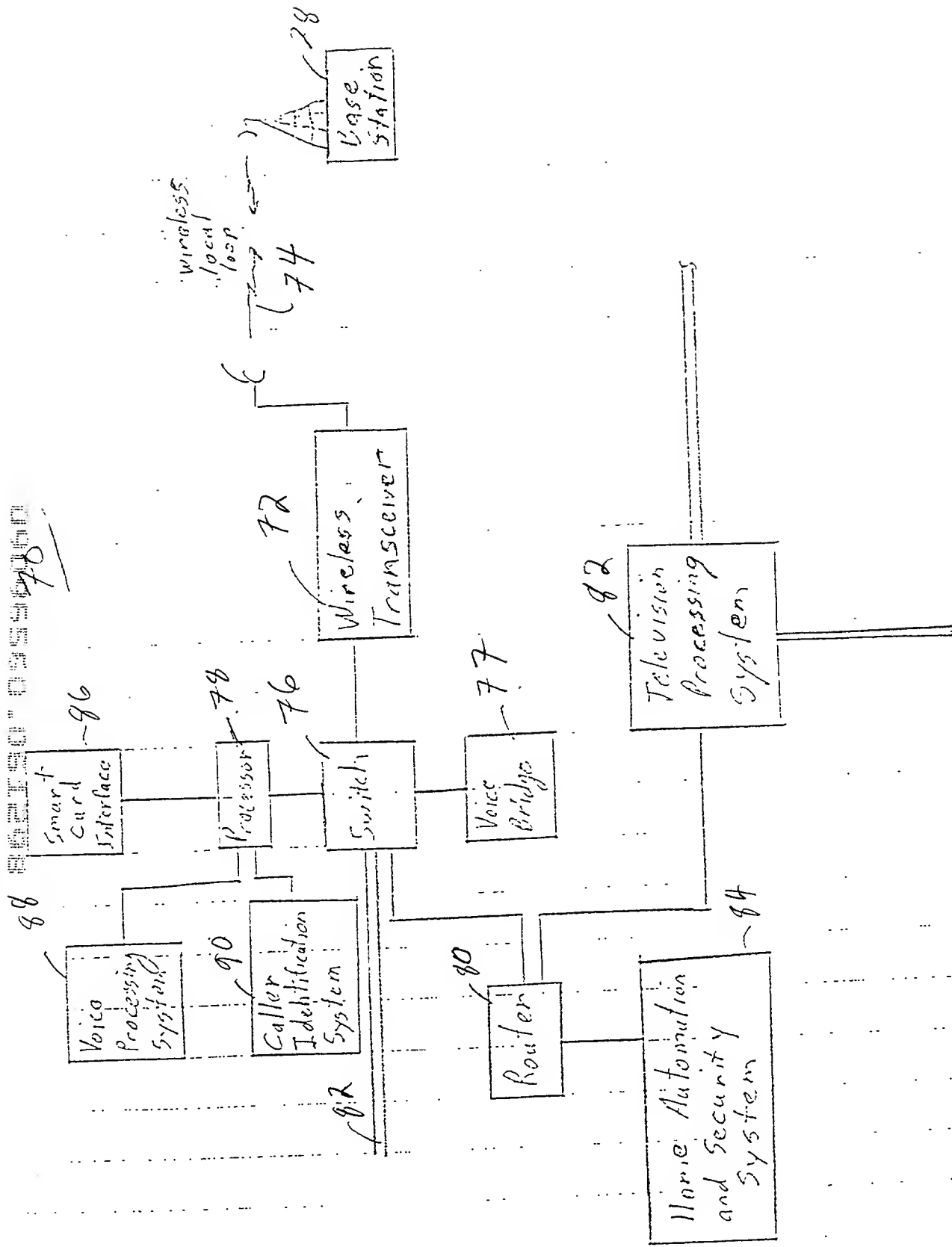


FIG. 3

88

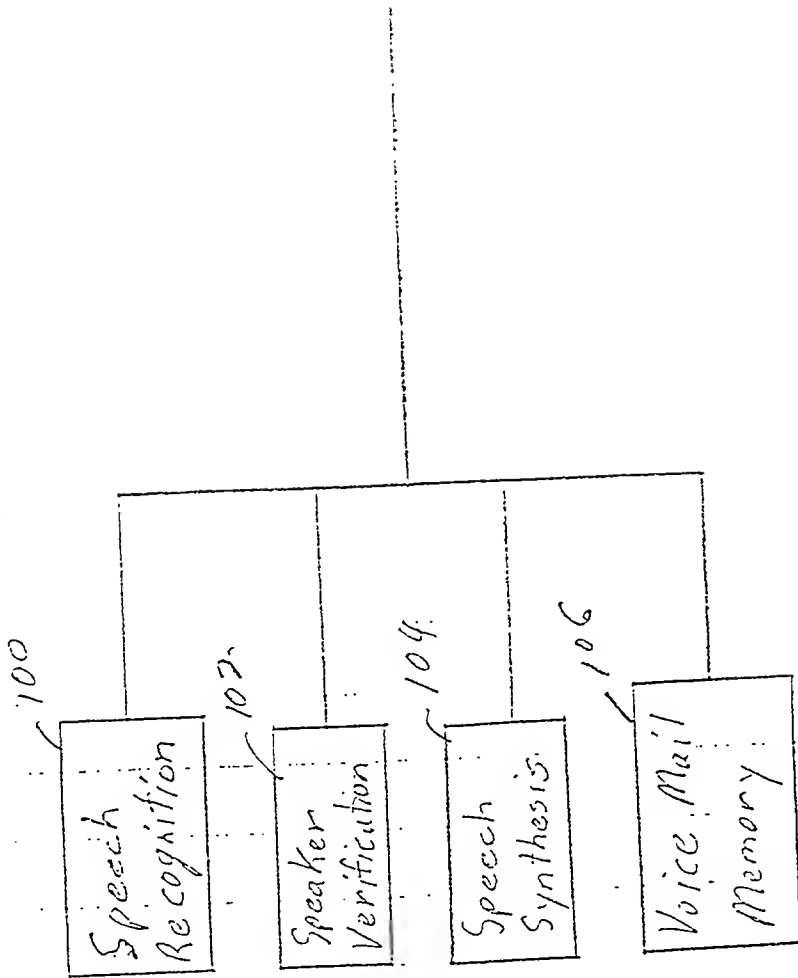


FIG. 4

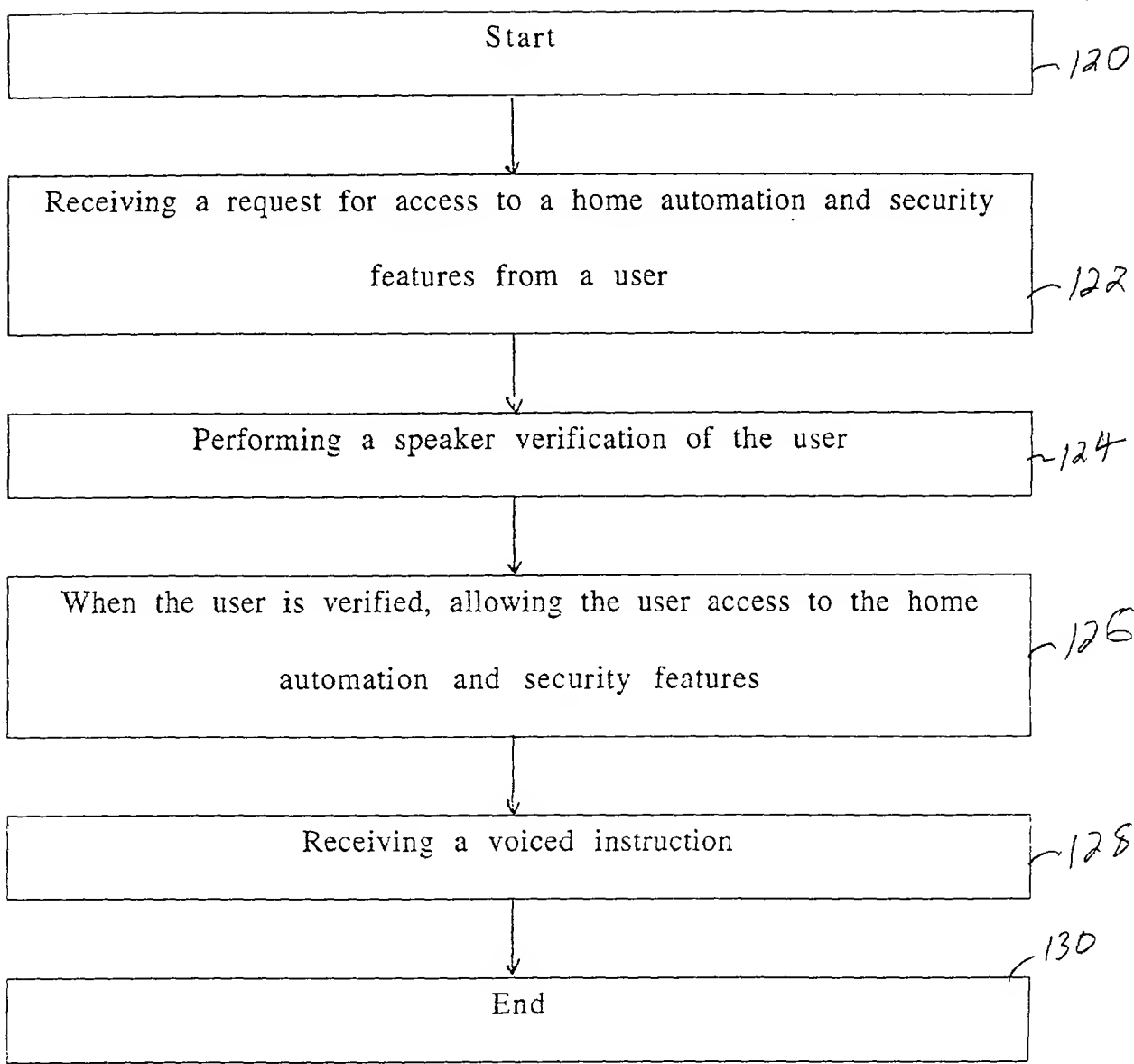


FIG. 5

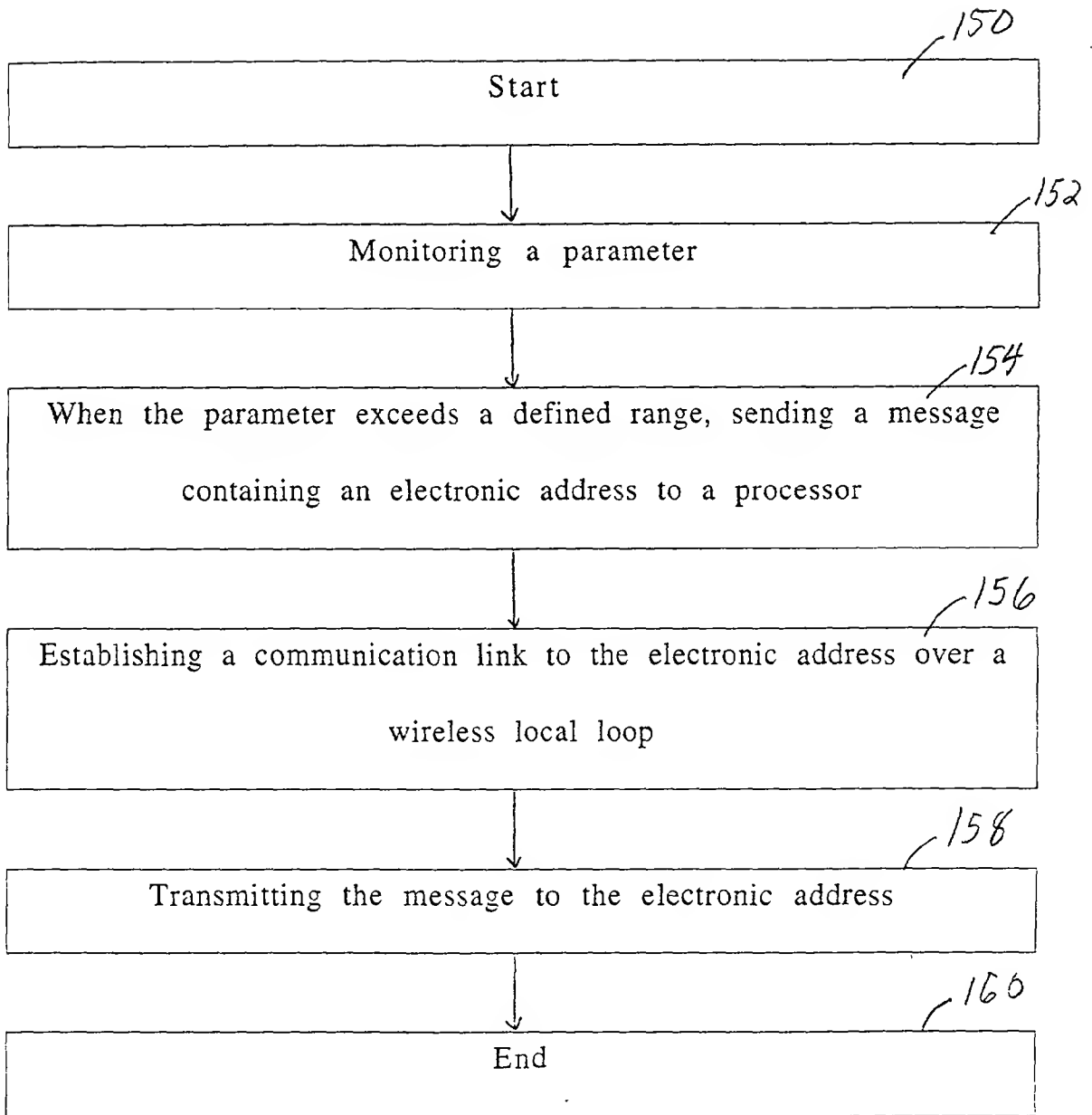


FIG. 6

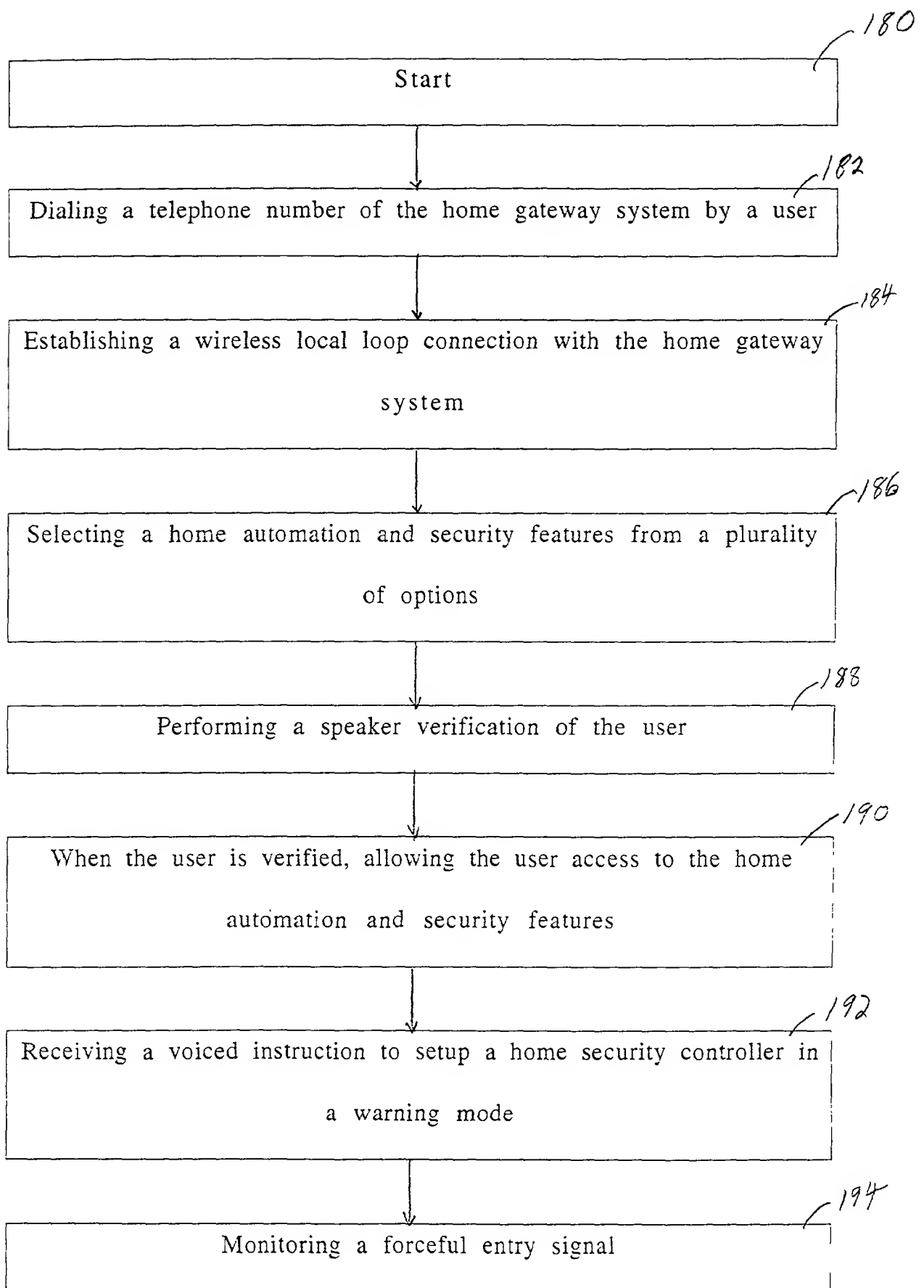


FIG. 7

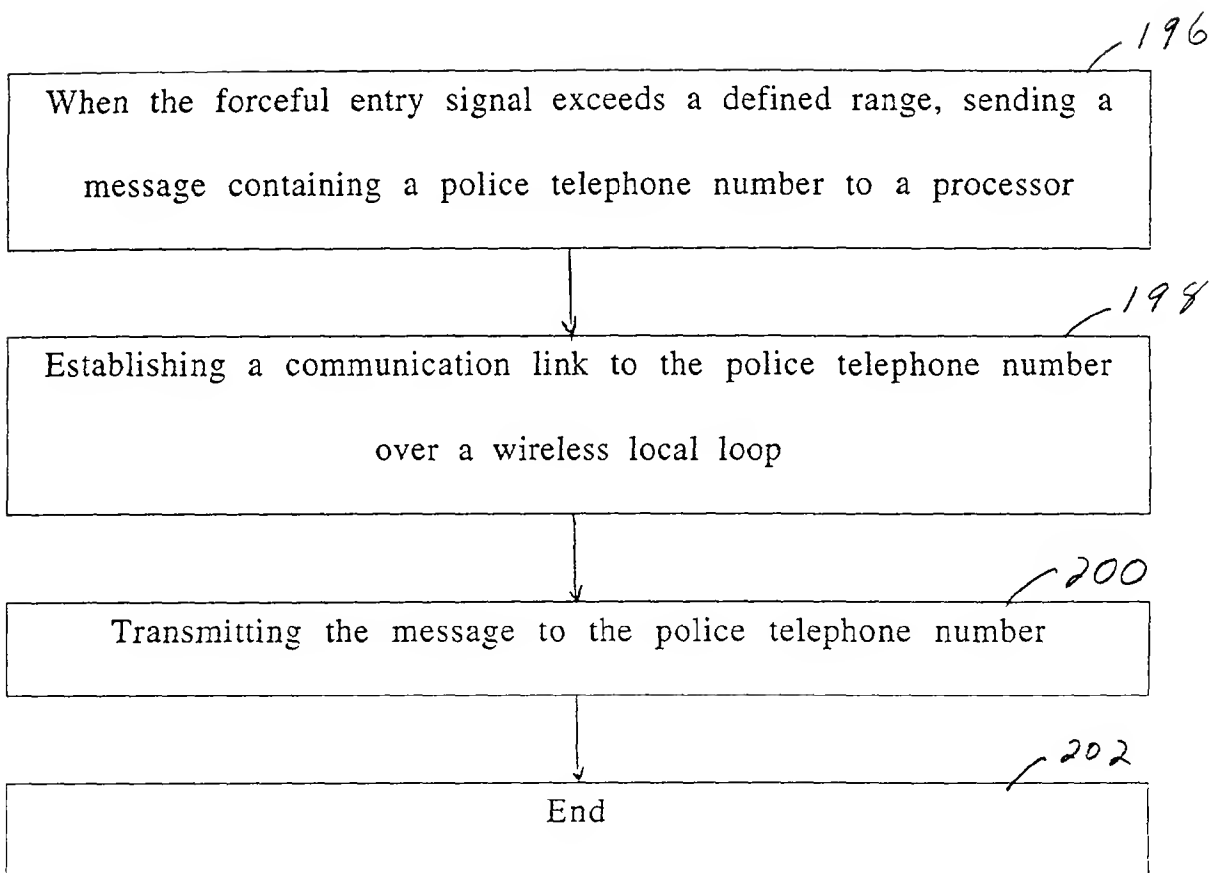
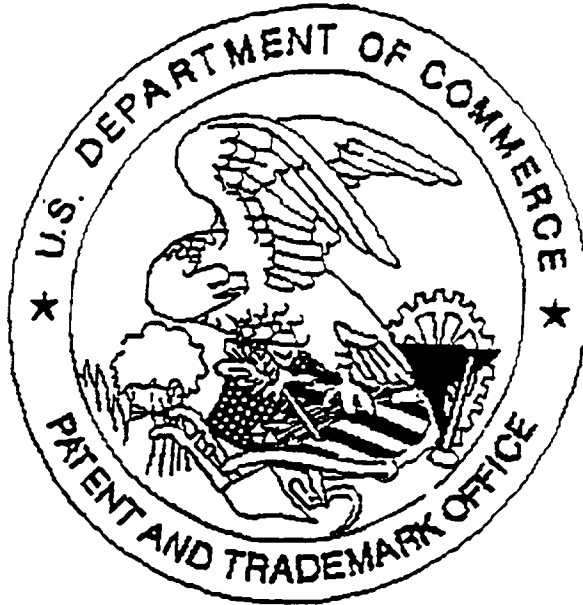


FIG. 5

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